SEMI-ANNUAL STATUS REPORT

FOR THE PERIOD

September 1967-February 1968

ON

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

RESEARCH GRANT NGR 03-001-034

TO

ARIZONA STATE UNIVERSITY

TEMPE, ARIZONA

Principal Investigator

A. Alan B. Pritsker

NETWORK PROCEDURES FOR MODELING AND ANALYZING PRODUCTION PROCESSES

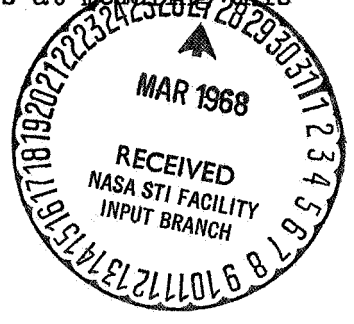
The objectives of this research grant involve the development of network procedures for modeling and analyzing complex processes. Based on the successful application of the network technique, GERT, to the analysis of a terminal countdown of an apollo space system, it was decided to investigate and perform further research on GERT. The specific activities during the first six months of this grant have been:

1. The development of computer programs which perform the calculations required by GERT networks;
2. The modeling of a production system in GERT network terms; and
3. The use of GERT in planning for R and D.

PROGRESS

Two programs have been developed in the FORTRAN II language for analyzing processes which can be modeled graphically in GERT network terms. Manuals are being prepared for these two programs to permit computer centers with FORTRAN II compilers to use the programs. Initial steps have been taken to incorporate the programs developed into the COSMIC system.

Preliminary models of the production of semi-conductors have been developed. Difficulties have been encountered in representing alternatives directly on the GERT network. Research is proceeding in an attempt to alleviate this difficulty. On the area of planning research and development, research to date has been devoted to understanding the R and D process. Several attempts at modeling this



planning process have been made. Research on this area will be continued during the next six month period.

EXPECTED RESULTS FROM GRANT

The following results and publications are expected from this research grant:

1. Delivery of two programs to the COSMIC library for analyzing GERT networks.
2. Preparation and distribution of manuals describing the two GERT programs.
3. A paper on the use of GERT networks for modeling semi-conductor production.
4. A paper on the use of network models for planning research and development efforts.

These items will constitute the main portion of the final report.

STUDENTS BENEFITING FROM THE RESEARCH GRANT

There are two Ph D students who are supported by this research grant. The students and their area of activity are Mr. Phillip Ishmael, development of GERT programs, and Mr. Ronald Enlow, application of GERT to planning R and D. Three other Ph D students are working under the supervision of Dr. Pritsker, the principal investigator, in the development of GERT. Although these students are not directly associated with the research grant they are indirectly benefiting from the research grant: Mr. Thomas Hill-The Inversion of the Output from GERT Networks, Mr. David Gallagher-The Use of GERT in Studying Queueing Problems, Mr. Donald Deutsch-The Use of GERT for Optimizing Production Processes.

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